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First in real-time computer systems.

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UNIVAC

1106/1108 systems

pacesetters of the industry

facts & figures

SPERRY RAND

1106, 1108 Facts and Figures

UNIVAC® 1106 and 1108 systems offer you the most powerful combinations of hardware and software in the industry per dollar outlay. They take the state of the art one better in the advancement of electronic data processing.

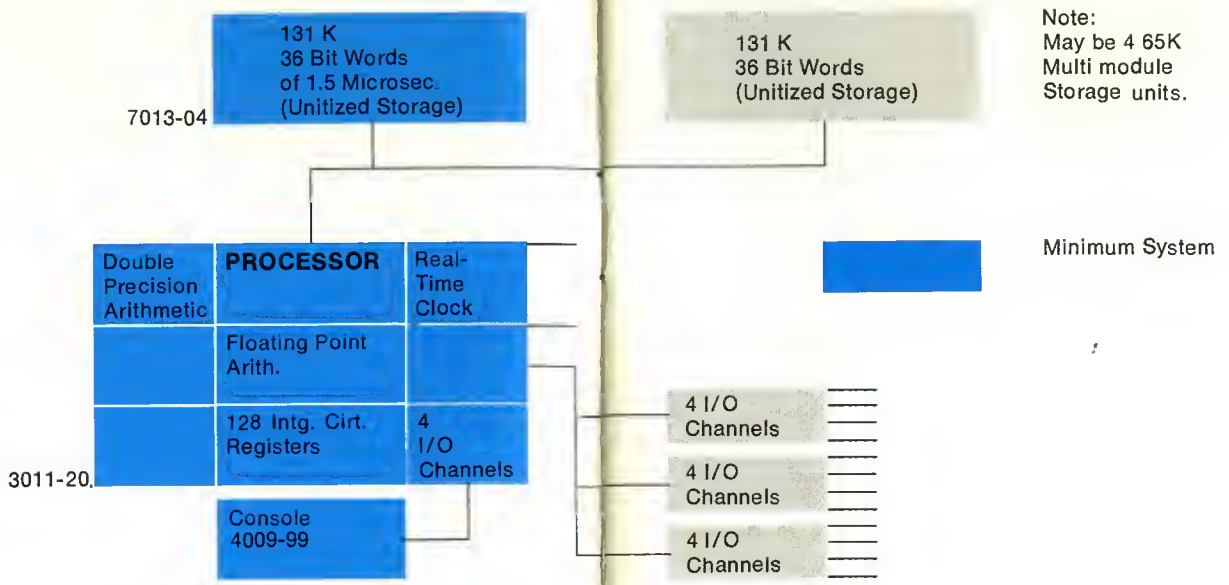
You begin with the UNIVAC 1106 medium scale system . . . and it is medium scale in name and price only. Here is a true general purpose system that meets the diverse needs of business, government and science with ease. It uses either EXEC II which has been enhanced to make it the best serial operating system in its class, or EXEC 8 as it is currently operating at many 1108 sites in demand or real time environments. As your workload increases the system can be upgraded on site to fit your demands. The 1106 has been designed with the future in mind. Its modular design allows it to be expanded with more storage and peripherals to meet the most sophisticated applications while it meets your daily business requirements. The 1106 may also be configured as a multiprocessor; or to facilitate your entry into the world of NOW, the 1106 is available with a Disc Resident Software System.

UNIVAC 1108
The powerful all purpose system

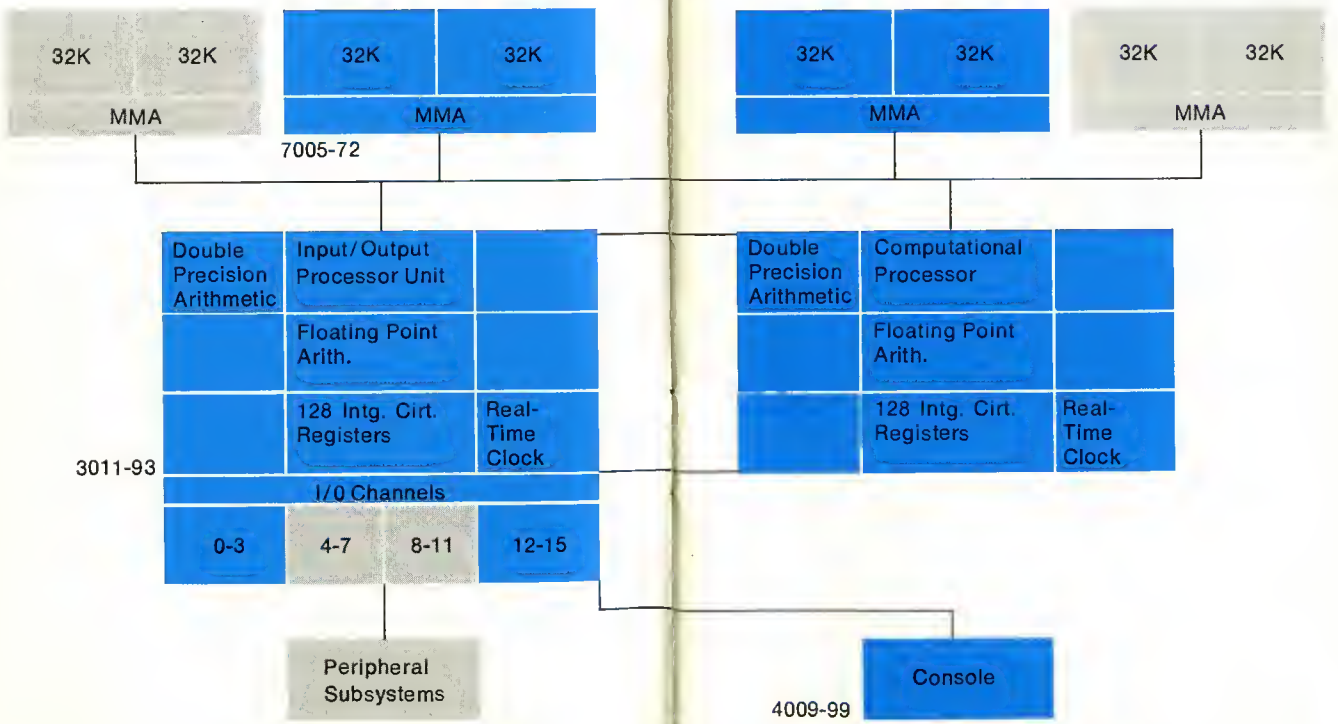
Whatever your business . . . if the application requires a large scale computer, the UNIVAC 1108 system is more than adequate. Here is a system that can handle complex industrial needs, strategic government work, exacting scientific problems and futuristic engineering analysis with ease. It can plan cities, figure taxes, forecast sales and answer complicated scientific questions while it prepares checks, sends out bills, and controls the warehouses. It is a product of the know-how of the creators of the world's first real time system and utilizes the present version of EXEC 8, the industry's most comprehensive operating system.

Both the 1106 and the 1108 will more than measure up to your demands. Start with the 1106 . . . as you grow, your system will grow with you. Really isn't that the logical way it should be?

1106 Processor and Main Storage Configurator



1108 Shared Processing System



Processor and storage facts
The central processor is the principal component of UNIVAC 1100 systems. It performs both arithmetic and logical operations and supervises up to 16 input/output channels.

Principal section
Control Registers—128 program-addressable registers

Arithmetic Section—performs fixed and floating point arithmetic, shifting, logical operations, and tests

Control Section—provides control and logic for instruction decoding and execution

Input/Output Section—controls and monitors data flow

Indexing Section—used for processor control functions

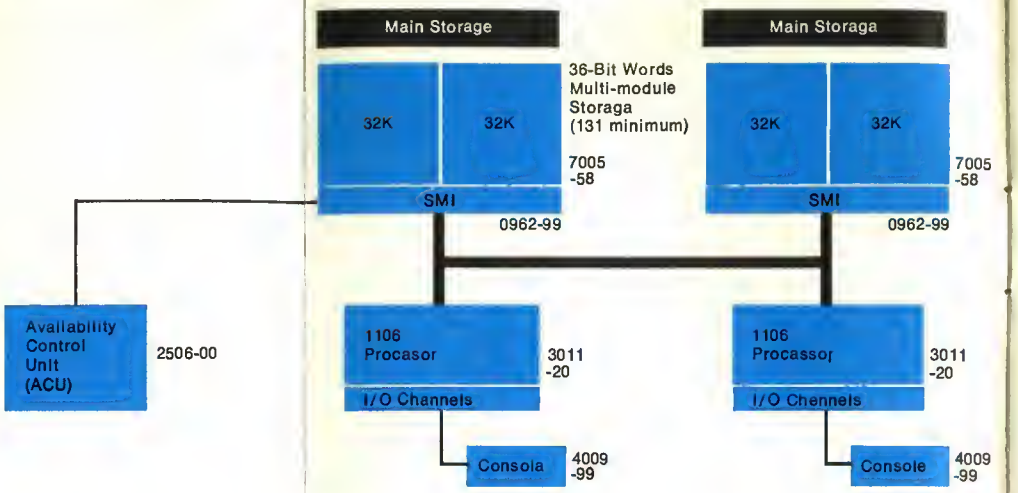
All channels can be ESI or ISI except the channel which has the console.

PROCESSOR AND STORAGE FACTS 1108 SHARED PROCESSING SYSTEM

Input/output processor unit
Identical to Principal Section

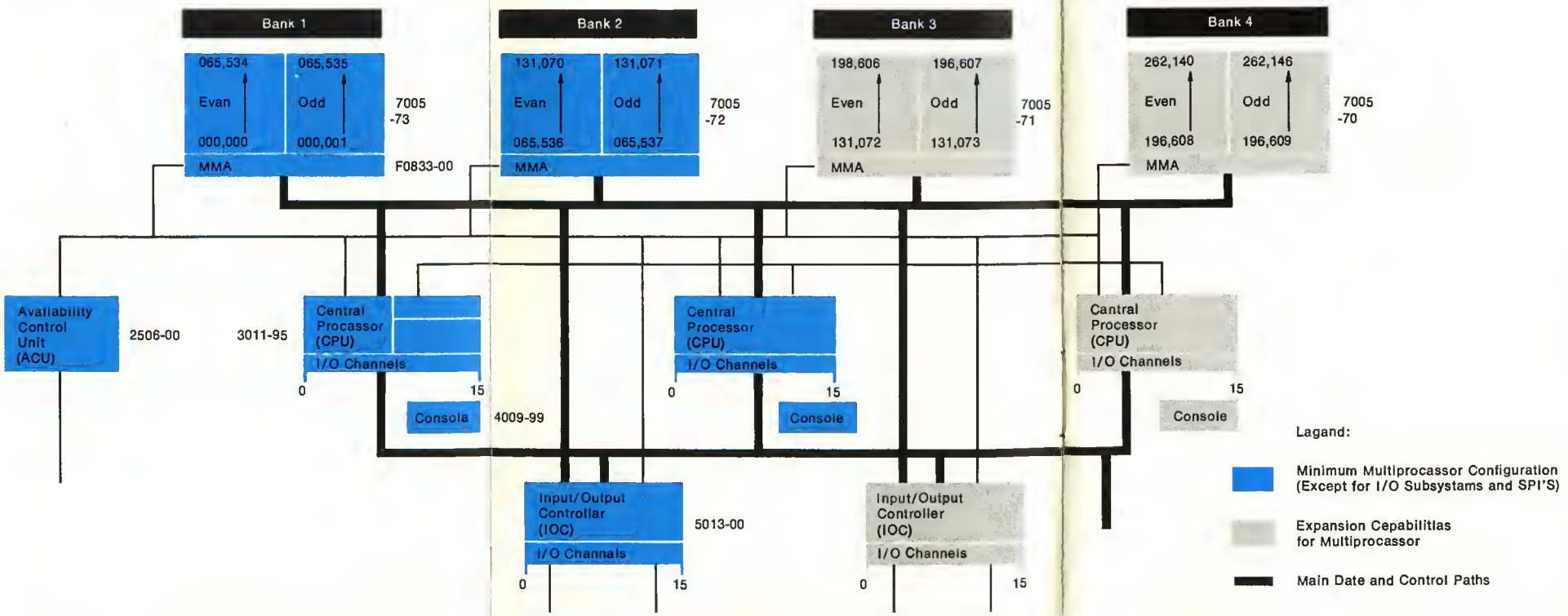
Computational processor
The Computational Processor has all the features of the principal section with the exception of the input/output capability.

1106 Multiprocessor and Main Storage Configurator



Minimum 1106 MP Configuration

1108 Processor and Main Storage Configurator



I/O Channels

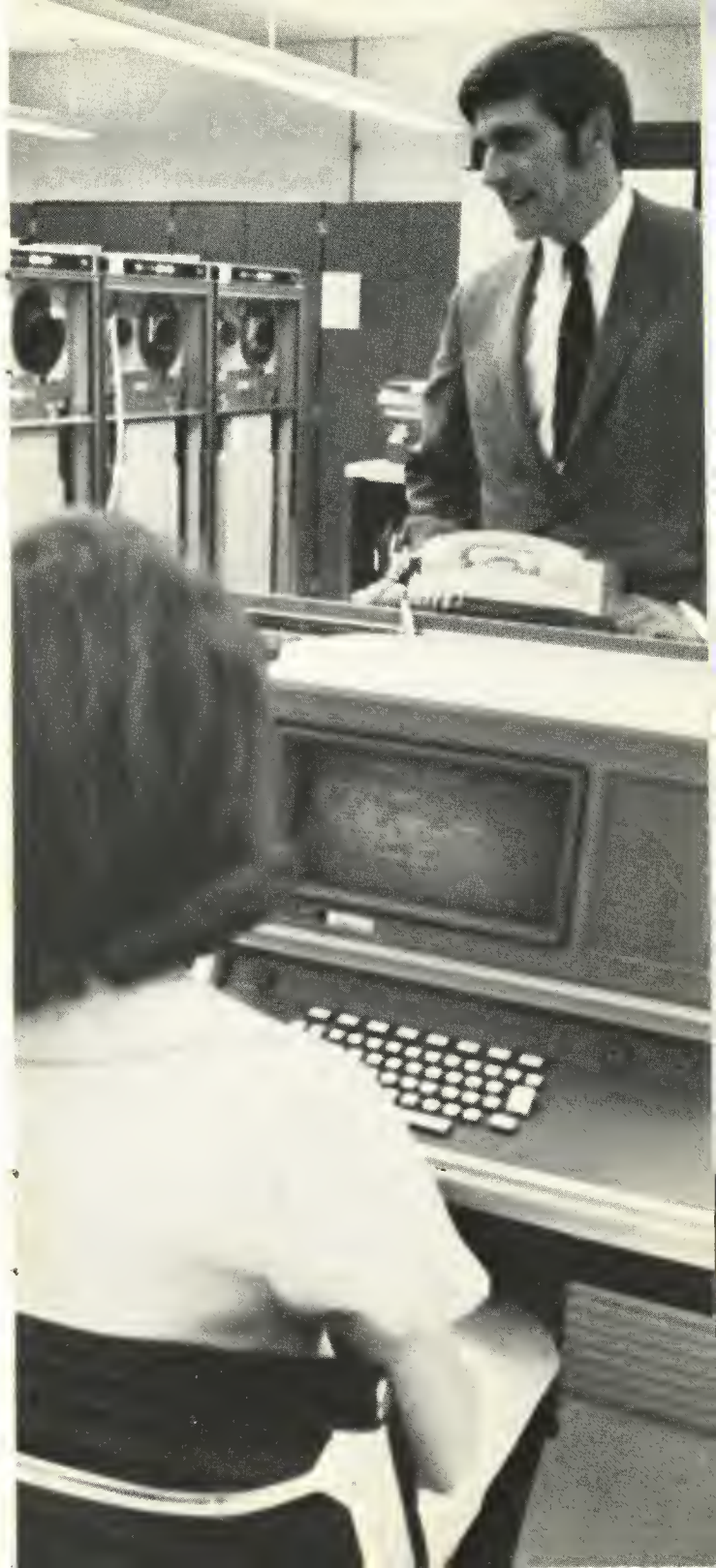
1106		**1108**	
Min.	Max.	Min.	Max.
4	16	8	16

Word Size:
36 bits with 2 parity bits

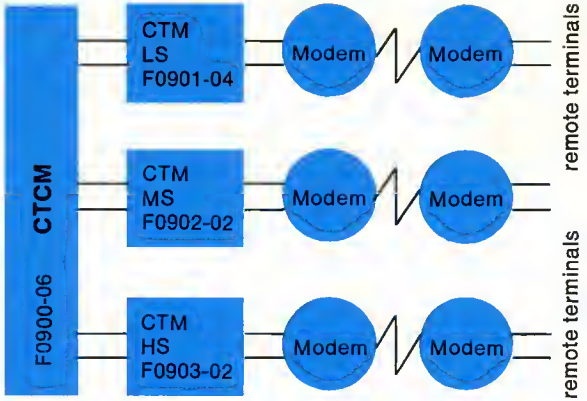
36 bits with 2 parity bits

Primary Storage

1106		**1108** Multi-Module Memory
Minimum	65K	65K
Expansion To	131K 196K 262K	131K 196K 262K
Read/Restore Cycle-time	1.5 micro. sec.	750 nano. sec.



CTMC Configurator



Communication Facts

Communications Terminal Module Controller (CTMC) transmits data between the CTM's and the central processor. A CTMC may be connected to any processor I/O channel, multiplexing up to 16 CTM's to that channel.

Communications Terminal Module (CTM)
The function of the CTM is to provide: (1) a logical and electrical interface, (2) buffering, (3) control circuitry for termination of the communication lines at the CTMC. Each CTM provides termination for a specific number of lines dependent upon the speed of the line and the line control capability required by the user. Lines may operate in simplex, half duplex or full duplex mode. Enhanced line control capabilities include character and message parity generation and checking, end of message recognition, automatic dialing control, late input acknowledge, idle line character, external interrupt generation and unattended answering.

CTM Low Speed

Line Speed	To 300 BPS
Transmission	Asynchronous 5, 6, 7, 8 level
Lines Terminated	2 In/2 Out

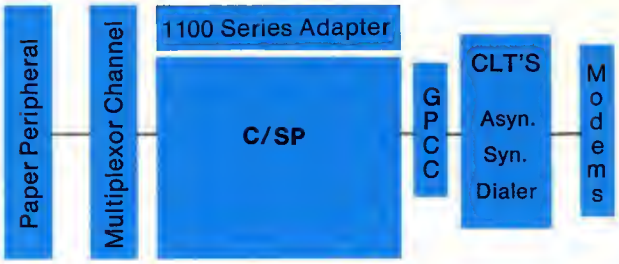
CTM Medium Speed

Line Speed	To 1600 BPS
Transmission	Asynchronous 5, 6, 7, 8 level
Lines Terminated	2 In/2 Out

CTM High Speed

Line Speed	To 4800 BPS
Transmission	Synchronous 5, 6, 7, 8 level
Lines Terminated	2 In/2 Out

Communications/Symbiont Processor (C/SP)



The UNIVAC Communications/Symbiont Processor (C/SP) is a high performance internally programmed communications concentrator. It provides control for a variety of high and low speed communication lines, while interfacing with a general purpose computer.

The C/SP unburdens the processor of the necessity of handling communications.

Asynchronous Communications Line Terminal

Line Speed	45-2400 BPS
Facilities	Pvt. Telegraph, TWX, Telex, Voice Band
Interfaces	EIA RS232C, CCITT, MIL. STD. 188B
Mode	One Line Start-Stop

Synchronous Communications Line Terminal

Line Speed	600-50,000 BPS
Facilities	Voiceband, Broadband, Direct Wire
Interfaces	EIA RS232C, CCITT, MIL. STD. 188B
Mode	One Line Synchronous
Dialer Interface	AT&T 801 Automatic Calling Unit

UNIVAC Remote Terminals*

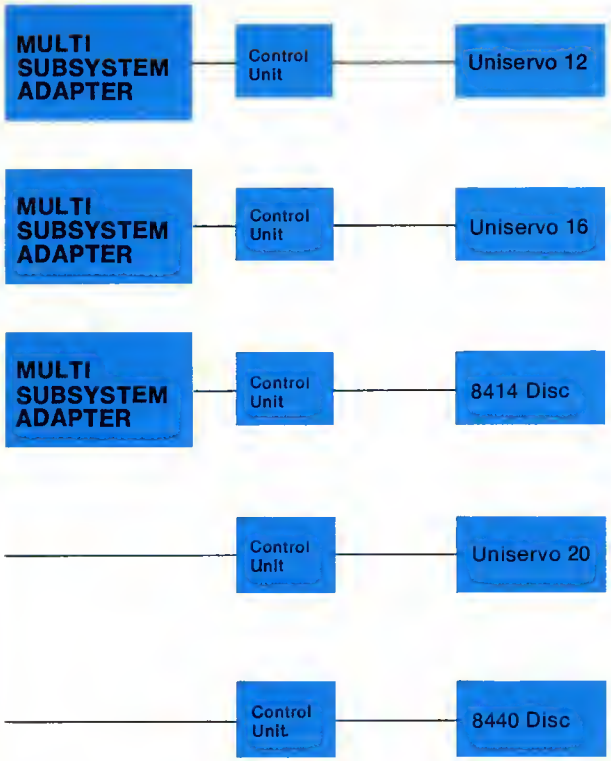
9300	UNISCOPE™ 100
9200	UNISCOPE 300
DCT-500	1004/1005
DCT-1000	
DCT-2000	

I/O Devices

Local Peripheral Facts

		1108	1106
Auxiliary Storage			
FH 432 Drum**	Average Access	4.25 msec.	4.25 msec.
	Capacity	262,144 words or 1,572,864 Ch.	262,144 words or 1,572,864 Ch.
	Transfer rate	240,000 words or 1,440,000 Ch/Sec.	240,000 words or 1,440,000 Ch/Sec.
	Max. Per Subsystem	8	8
	I/O Channel*	1	1
FH 1782 Drum**	Average Access	17.0 msec.	17.0 msec.
	Capacity	2,097,152 words or 12,582,912 Ch.	2,097,152 words or 12,582,912 Ch.
	Transfer rate	240,000 words or 1,440,000 Ch/Sec.	240,000 words or 1,440,000 Ch/Sec.
	Max./Subsystem	8	8
	I/O Channel*	1	1
FASTRAND™ III	Average Access	92 msec.	92 msec.
	Capacity	33,030,144 words or 198,180,864 Ch.	33,030,144 words or 198,180,864 Ch.
	Transfer rate	39,424 words or 230,400 Ch/Sec.	39,424 words or 230,400 Ch/Sec.
	Max./Subsystem	8	8
	I/O Channel*	1	1
Magnetic Tape Subsystems			
UNISERVO™ VI C**	Transfer rate	11,383 to 45,547 Ch/Sec.	11,383 to 45,547 Ch/Sec.
	Recording density	200/556/800 BPI	200/556/800 BPI
	Tracks	7 or 9	7 or 9
	Max./Subsystem	16	16
	I/O Channel	1	1
UNISERVO VIII C**	Transfer rate	32,000 to 120,000 Ch/Sec.	32,000 to 120,000 Ch/Sec.
	Recording density	200/556/800 BPI	200/556/800 BPI
	Tracks	7 or 9	7 or 9
	Max./Subsystem	16	16
	I/O Channel*	1	1
Printer Subsystem (0758)	Print Speed	1200/1600 LPM	1200/1600 LPM
	Ch/Line	132	132
	Ch. Printed	43/63	43/63
	Horiz. Spacing	10 Ch/Inch	10 Ch/Inch
	Vert. Spacing	6 and 8 Lines/Inch	6 and 8 Lines/Inch
	I/O Channel	1	1
Card Subsystem	Card Read	900 CPM	900 CPM
	Card Punch	300 CPM	300 CPM
	I/O Channel	1	1
UNIVAC 9300 Subsystem	Card Read	600 CPM	600 CPM
	Card Punch	75-200 or 200	75-200 or 200
	Print Speed	600/1200 LPM	600/1200 LPM
	I/O Channel	1	1

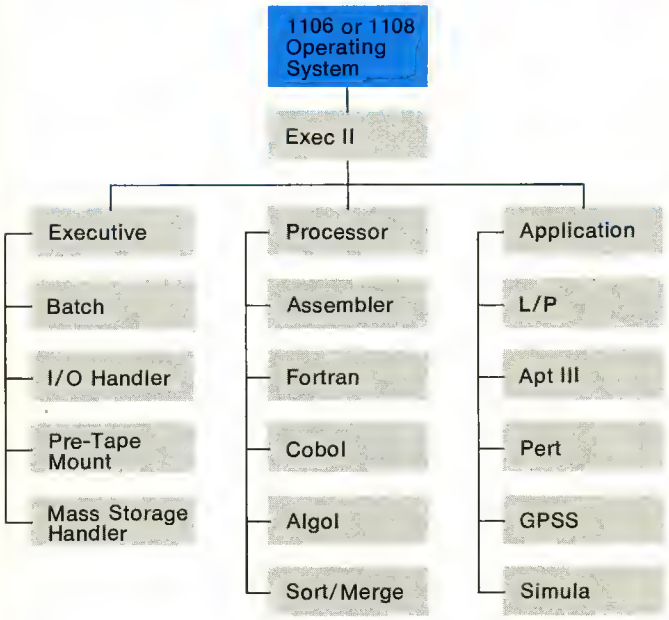
*Can provide simultaneous dual access using 2 channels.
**May be mixed.
Transfer rates stated apply to 9 track series



UNISERVO 12	Transfer Rate	34,160; 23,740; or 8,540
	Char/sec	7 track
	68,320; 34,160 frame/sec	9 track
	Track	7 or 9
	Max/subsystem	16
	I/O Channel*	1
UNISERVO 16	Transfer Rate	96,000; 66,720; or 24,000
	Char/sec	7 track
	192,000 or 96,000 frame/sec	9 track
	Track	7 or 9
	Max/subsystem	16
	I/O Channel*	1
8414 Disc	Average Access	60 Msec.
	I/O Channel*	1
	Transfer Rate	69,333 wds/sec
	Subsystem	2-8 units
UNISERVO 20	Transfer Rate	320,000 frames/sec.
	Recording Density	1600 ppi
	Tracks	9
	Subsystem	up to 16
	I/O Channels	1
8440 Disc	Average Access	35 Msec.
	Capacity	114 million chars.
	Transfer Rate	138,888 wds./sec.
	Subsystem	1-8 drives

Multi-Subsystem Adapter Data translation capability
Byte-word conversion • Multiple interface
Chained command and search parameter storage

*Can provide simultaneous dual access using 2 channels.



1100 Operating System

The 1100 series offers the user an operating system to fit his requirements. If they include primarily medium scale batch, the 1106 under EXEC II is suitable. With a heavy workload the customer may pick the powerful 1108 with either EXEC 8 or EXEC II. In addition, there are language processors and system executive support libraries which allow total computing requirements.

EXEC II

The most proven large-scale serial operating system has been enhanced to allow additional remote batch work. This Executive will give maximum throughput to a business whose main needs are batch processing. The enhancement of a mass-storage handler and a tape pre-mount package will provide more efficient use of the central processor time.

1100 Operating System

EXEC 8

This operating system has been designed to take advantage of the speed and hardware capabilities to allow a proper balance of the system to give effective use of the configured hardware. EXEC 8 is designed to do batch, demand, and real time processing. Their modes are processed concurrently whenever sufficient storage is available. The Executive will schedule and control various runs at different stages of activity, thereby giving multi-programming.

Language Processors

Assembler
Translates a symbolic language to machine-language relocatable object coding for the 1100 machine. It allows programmers to generate data words, values or instructions at assembly time.

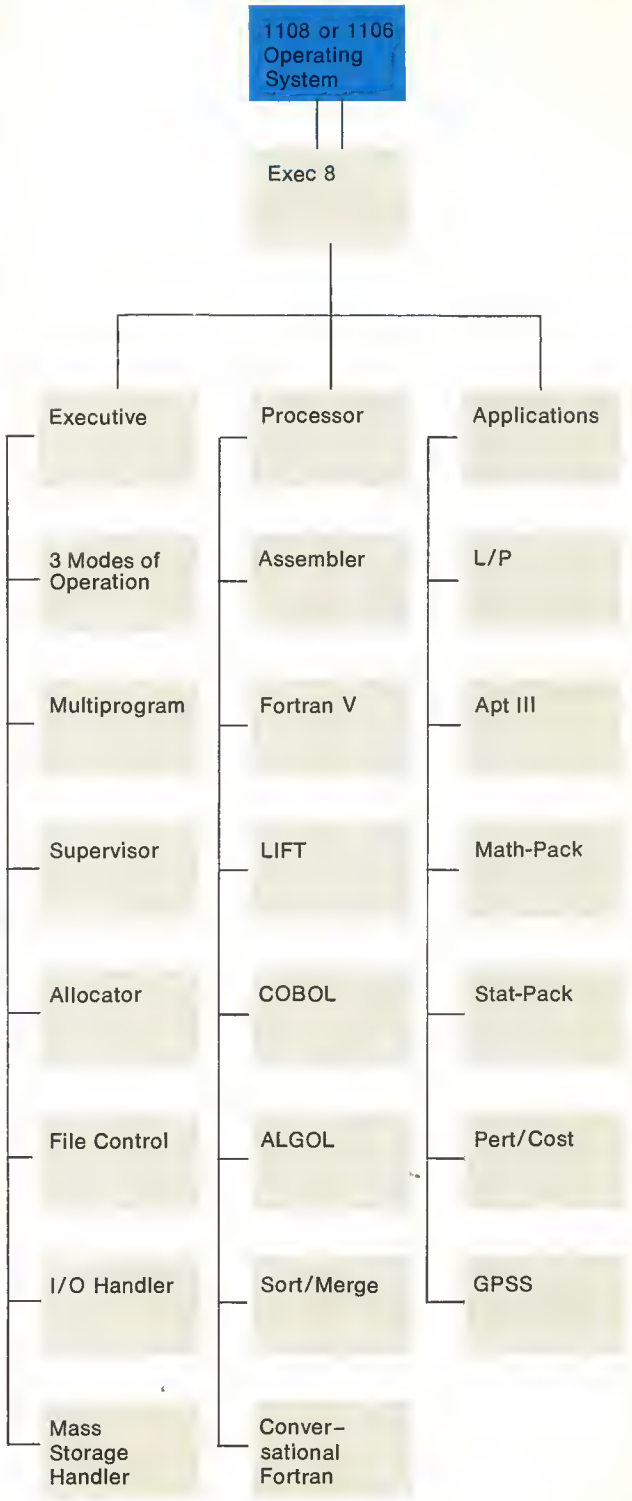
FORTRAN V
Designed for scientific and engineering computations with all the features of USASI FORTRAN IV plus many valuable extensions.

American National Standard (ANS) COBOL
The UNIVAC COBOL compiler provides the complete ANS COBOL, less the report writer. Any program written to conform to ANS specifications can be run using this compiler without the need for any conversion. ANS COBOL is easily learned and used.

ALGOL
SORT/MERGE
LIFT—FORTRAN II to FORTRAN V translator

Applications
Linear Programming

APT III
PERT/COST
MATH-PACK
STAT-PACK
GPSS
SIMULA



Instruction Repertoire

Operation Code	Description	1106 Timing (μ sec.)	1108 Timing (μ sec.)
LA	Load A	1.5	.75
LNA	Load Negative A	1.5	.75
LMA	Load Magnitude A	1.5	.75
LNMA	Load Negative Magnitude A	1.5	.75
LR	Load R	1.5	.75
LX	Load X	1.5	.75
LXM	Load X Modifier	1.166	.875
LXI	Load X Increment	1.833	1.0
DL	Double Load A	3.0	1.5
DLN	Double Load Negative A	3.0	1.5
DLM	Double Load Magnitude A	3.0	1.5
SA	Store A	1.5	.75
SNA	Store Negative A	1.5	.75
SMA	Store Magnitude A	1.5	.75
SX	Store X	1.5	.75
SR	Store R	1.5	.75
DS	Double Store A	3.0	1.50
SZ	Store Zero	1.5	.75
BT	Block Transfer	3.5+3.0K	1.5+1.5K
AA	Add to A	1.5	.75
ANA	Add Negative A	1.5	.75
AMA	Add Magnitude to A	1.5	.75
ANMA	Add Negative Magnitude to A	1.5	.75
AU	Add Upper	1.5	.75
ANU	Add Negative Upper	1.5	.75
MI	Multiply Integer	3.666	2.375
MSI	Multiply Single Integer	3.666	2.375
MF	Multiply Fractional	3.666	2.375
DI	Divide Integer	13.950	10.125
DSF	Divide Single Fractional	13.950	10.125
DF	Divide Fractional	13.950	10.125
DA	Double Precision Fixed Point Add	3.167	1.625
DAN	Double Precision Fixed Point Add Negative	3.167	1.625
AH	Add Halves	1.5	.75
ANH	Add Negative Halves	1.5	.75
AT	Add Thirds	1.5	.75

Instruction Repertoire

Operation Code	Description	1106 Timing (μ sec.)	1108 Timing (μ sec.)
ANT	Add Negative Thirds	1.5	.75
AX	Add to X	1.5	.75
ANX	Add Negative to X	1.5	.75
FA	Floating Add	3.0	1.875
FAN	Floating Add Negative	3.0	1.875
FM	Floating Multiply	4.0	2.625
FD	Floating Divide	11.5	8.25
LUF	Load and Unpack Floating	1.5	.75
LCF	Load and Convert to Floating	2.0	1.125
DFA	Double Precision Floating Add	4.5	2.625
DFAN	Add Negative	4.5	2.625
DFM	Multiply	6.667	4.250
DFD	Divide	24.0	17.25
DFF	Double Load and Convert to Floating	3.830	2.125
MCDU	Magnitude of Characteristic Difference to Upper	1.5	.75
CDU	Characteristic Difference to Upper	1.5	.75
FEL	Floating Expand and Load	1.833	1.0
	Floating Compress and Load	3.166	1.625
AX	Add to X	1.5	.75
ANX	Add Negative to X	1.5	.75
LXM	Load X Modifier	1.166	.875
LX	Load X	1.5	.75
SX	Store X	1.5	.75
LXM	Load X Increment	1.833	1.00
LMJ	Load Modifier and Jump	1.666	.75
TLEM	Test Less or Equal to Modifier	3.333/1.833	1.75/ 1.00
JMGI	Jump Modifier Greater and Increment	3.166/1.5	1.625/ .75
OR	Logical OR	1.5	.75
XOR	Logical Exclusive OR	1.5	.75
AND	Logical AND	1.5	.75
MLU	Masked Load Upper	1.5	.75

Instruction Repertoire

Operation Code	Description	1106 Timing (μ sec.)	1108 Timing (μ sec.)
SSC	Single Shift Circular	1.5	.75
DSC	Double Shift Circular	1.5	.75
SSL	Single Shift Logical	1.5	.75
DSL	Double Shift Logical	1.5	.75
SSA	Single Shift Algebraic	1.5	.75
DSA	Double Shift Algebraic	1.5	.75
LSC	Load Shift and Count	2.0	1.125
DLSC	Double Load Shift and Count	3.830	2.125
LSSC	Left Single Shift Circular	1.5	.75
LDSC	Left Double Shift Circular	1.660	.75
LSSL	Left Single Shift Logical	1.5	.75
LDSL	Left Double Shift Logical	1.660	.75
SE	Search for Equal	3.5+1.5K	2.25+.75K
SNE	Search for Not Equal	3.5+1.5K	2.25+.75K
SLE	Search for Less or Equal	3.5+1.5K	2.25+.75K
SG	Search for Greater	3.5+1.5K	2.25+.75K
SW	Search for Within Range	3.5+1.5K	2.25+.75K
SNW	Search for Not Within Range	3.5+1.5K	2.25+.75K
	Masked Search for:		
MSE	Equal	3.5+1.5K	2.25+.75K
MSNE	Not Equal	3.5+1.5K	2.25+.75K
MSLE	Less or Equal	3.5+1.5K	2.25+.75K
MSG	Greater	3.5+1.5K	2.25+.75K
MSW	Within Range	3.5+1.5K	2.25+.75K
MSNW	Not Within Range	3.5+1.5K	2.25+.75K
MASL	Masked Alphanumeric Search for Less or Equal	3.5+1.5K	2.25+.75K
MASG	Masked Alphanumeric Search for Greater	3.5+1.5K	2.25+.75K
SLJ	Store Location and Jump	3.83	2.125
LMJ	Load Modifier and Jump	1.666	.75
JGD	Jump on Greater and Decrement	3.0/1.5	1.5/.75
DJZ	Double Precision Zero Jump	3.167/1.667	1.625/.875

Instruction Repertoire

Operation Code	Description	1106 Timing (μ sec.)	1108 Timing (μ sec.)
JPS	Jump on Positive and Shift	3.0/1.5	1.5/.75
JNS	Jump on Negative and Shift	3.0/1.5	1.5/.75
JZ	Jump on Zero	3.0/1.5	1.5/.75
JNZ	Jump on Non-Zero	3.0/1.5	1.5/.75
JP	Jump on Positive	3.0/1.5	1.5/.75
JN	Jump on Negative	3.0/1.5	1.5/.75
JK	Jump on Keys	1.5	.75
HKJ	Halt on Keys and Jump	1.5	.75
JNB	Jump on No Low Bit	3.0/1.5	1.5/.75
JB	Jump on Low Bit	3.0/1.5	1.5/.75
JMGI	Jump Modifier Greater and Increment	3.166/1.5	1.625/.75
JO	Jump on Overflow	3.0/1.5	1.5/.75
JNO	Jump on No Overflow	3.0/1.5	1.5/.75
JC	Jump on Carry	3.0/1.5	1.5/.75
JNC	Jump on No Carry	3.0/1.5	1.5/.75
JIC	Jump on Input Channel Busy	1.5	.75
JOC	Jump on Output Channel Busy	1.5	.75
JFC	Jump on Function in Channel	1.5	.75
TEP	Test Even Parity	3.0/2.166	2.0/1.25
TOP	Test Odd Parity	3.0/2.166	3.0/1.25
	Test Less or Equal to Modifier	3.333/1.833	1.75/1.0
TZ	Test for Zero	3.166/1.666	1.625/.875
TNZ	Test for Non-Zero	3.166/1.666	1.625/.875
TE	Test for Equal	3.166/1.666	1.625/.875
TNE	Test for Not Equal	3.166/1.666	1.625/.875
TLE	Test for Less or Equal	3.166/1.666	1.625/.875
TG	Test for Greater	3.166/1.666	1.625/.875
TW	Test for Within Range	3.33/1.66	1.75/1.0
TNW	Test for Not Within Range	3.33/1.66	1.75/1.0
TP	Test for Positive	3.0/1.5	1.5/.75
TN	Test for Negative	3.0/1.5	1.5/.75
DTE	Double Precision Test Equal	4.667/3.167	2.375/1.625
EX	Execute	2.33	.75
NOP	No Operation	1.5	.75
TS	Test and Set	3.166/1.666	1.125

Instruction Repertoire

Operation Code	Description	1106 Timing (μ sec.)	1108 Timing (μ sec.)
LIC	Load Input Channel	1.5	.75
LICM	Load Input Channel and Monitor	1.5	.75
DIC	Disconnect Input Channel	1.5	.75
LOC	Load Output Channel	1.5	.75
LOCM	Load Output Channel and Monitor	1.5	.75
DOC	Disconnect Output Channel	1.5	.75
LFC	Load Function in Channel	1.5	.75
LFCM	Load Function in Channel and Monitor	1.5	.75
AACI	Allow All Channel External Interrupts	1.5	.75
PACI	Prevent All Channels External Interrupts	1.5	.75
ER	Executive Return	1.5	1.375
SCN	Store Channel Number	1.5	.75
LPS	Load Processor State Register	1.5	.75
LSL	Load Storage Limits Register	1.5	.75
III	Initiate Interprocessor Interrupt	1.5	.75
SIL	Select Interrupt Locations	1.5	.75
LCR	Load Channel Select Register/Load Last Address Register	1.666	.875
AAIJ	Allow All I/O Interrupts and Jump	1.5	.75
PAIJ	Prevent All I/O Interrupts and Jump	1.5	.75

Times given for the 1106 are calculated using a core memory cycle time of 1.5 microseconds and a CPU cycle time of 166 nanoseconds.

Times given for the 1108 are calculated using a core memory cycle time of .75 microseconds and a CPU cycle time of 125 nanoseconds.

For all comparison instructions, the first number represents the skip or jump condition, the second number is for no skip or no jump condition.

Execution time for the Block Transfer and the Search instruction depends on the number of repetitions of the instruction required. The variance is 3.0K microseconds for block transfer and 1.5K microseconds for searches where K equals the number of repetitions; that is, K equals the number of words in the block being transferred or the number of words searched before a match is found.